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STATE OF ALASKA
Keith H. Miller, Governor

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FEDERAL AID IN FISH RESTORATION PROJECT F-9-1

SPORT FISH INVESTIGATIONS OF ALASKA

ALASKA DEPARTMENT OF FISH AND GAME
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INTRODUCTION

This report of progress involves the findings and work accomplished under the State of Alaska, Federal Aid in Fish Restoration, Project F-9-1, "Sport Fish Investigations of Alaska".

The work conducted during this reporting period constitutes effort on nine separate studies which are crucial in evaluating the sport fishing resources of the State. Recreational demands have necessitated broadening our knowledge of the fishery. All 20 jobs were of continuing nature enabling the Department to keep abreast of present and future impacts on certain fish species. Specifically, the work included work on inventory and cataloging of the sport fish and sport fish waters of the State, sport fishery creel census and access. Special emphasis was given to Dolly Varden, silver salmon, anadromous fish, grayling, salmon, sheefish, pike, and char. The information gathered has provided supporting documentation for better fish management and a basis for necessary future investigations.

The subject matter contained in these reports may be inconclusive. The findings and interpretation are subject to re-evaluation as the work progresses.

RESEARCH PROJECT SEGMENT

STATE: ALASKA

Project No: F-9-1

Job No: 12-D

Name: Sport Fish Investigations of Alaska.

Title: Creel Census of the Sport Fisheries in the Bristol Bay Drainage.

Period Covered: July 1, 1968 to June 30, 1969.

ABSTRACT

Voluntary creel census returns from the Naknek River recreation camps failed to provide usable information during this reporting period, but total use figures for the three facilities did indicate an increase in effort from the Base Dock and a decline at the Lake and Rapids Camps.

The sport catch of king salmon, Oncorhynchus tshawytscha, on the Naknek River was censused by a stratified random sampling technique and estimated to total 2,203 fish.

The spring fishery for rainbow trout, Salmo gairdneri, on the Naknek River was observed on a non-random basis and an estimate of 570 angler days is thought to be minimal for the period prior to the April 15 closure. An attempt was made to randomly sample the post-closure fishery in the Lake and Rapids Camps areas. Other priority requirements for the limited available manpower resulted in inadequate sampling and consequent failure to produce acceptable estimates of either fishing effort, catch of rainbow trout or salmon.

A developing fishery for Dolly Varden char, Salvelinus malma, in the Naknek River system is briefly described.

Fishing effort for rainbow trout in the Lake Iliamna system is becoming more intense, as indicated by census sampling at Igiugig and Lower Talarik Creek from mid-August to early September.

Pressure on Ugashik grayling, Thymallus arcticus, remains low at the Outlet but has increased at the Narrows, particularly during summer months. Effort continues through late fall, directed increasingly toward Dolly Varden and Arctic char, S. alpinus, as grayling gradually leave the Narrows.

No creel census work was accomplished west of the Kvichak River drainage except in the Tikchik Lake system, where investigation was limited and yielded only general information.

The volume of visitors to the Katmai National Monument and to the Wien Consolidated Airlines Angler's Paradise Camp at the Kulik River increased by 25 and 30 percent, respectively, although angling pressure probably did not grow proportionally.

A general increase in angling activity is apparent throughout the entire area; much of it stemming from small, new guiding and charter flying businesses and from individuals.

RECOMMENDATIONS

1. That the collection of voluntary creel census data from the military recreation camps be continued, and that continuing attempts be made to increase the usefulness of such data with special reference to the fisheries for rainbow trout, red salmon and silver salmon.

2. That the direct census by Sport Fish Division personnel on the Naknek River during king salmon season be continued and refined.

3. That direct creel census sampling at key locations in the Lake Iliamna area be increased.

4. That some direct sampling at key locations within the Wood River Lakes system be provided.

5. That indications of fishing pressure trends throughout the study area be obtained through continued contacts with guides, charter pilots and lodge operators.

OBJECTIVES

To determine the extent and impact of angling pressures on the sport fish resources in specific recreational areas.

To determine and provide recommendations for future investigations and management of the study area waters.

TECHNIQUES USED

Frequent contacts were made with supervisory personnel of the military recreational facilities on the Naknek River. Figures for total use were obtained from these sources at the conclusion of the season.

A direct census employing a randomized sampling technique was conducted on the Naknek River by Sport Fish Division personnel during the period of king salmon fishing.

The entire Naknek River king salmon fishery was censused by boat during each sampling period, with a randomized statistical design utilized.

Each day, from 6 a.m. to 10 p.m., was divided into two-hour periods. A further division was made at 4 p.m. to form two strata, thus compensating for the influx of civilian effort in the evening. No stratification was deemed necessary on weekends. Each strata was sampled three times each week, with the day of sampling and the two-hour sampling period being randomly selected. During the sampling period, each boat on the river was contacted for all necessary information.

Census information was obtained directly during brief work periods or intermittent visits at the Ugashik Lakes, Igiugig and Lower Talarik Creek.

Information was obtained from guides, charter services and lodges by personal contact and through correspondence.

FINDINGS

Naknek River Studies

Military Reports:

Past creel census studies have relied heavily upon information derived from individual reports contributed by military anglers as part of a voluntary program of the Alaskan Command. While these have been limited in value, they have represented at least an index of effort and catch trends and have constituted a useful tool.

In spite of repeated contacts by Division personnel, the management of the recreational camps had failed to adequately stress the importance of the voluntary reporting during 1968, and the number of completed reports dropped from the previous year's level by 77 percent at the Lake Camp and 62 percent at the Rapids Camp, in spite of an overall reported drop of only 22 percent in the number of guests at these two locations. Due to the reduced number and sporadic nature of these reports, they did not constitute a usable source of information by which fishing trends for this season may be evaluated.

Figures on camp utilization, which do indicate overall military effort, were obtained from AAC headquarters and are presented in Table 1 for the years 1967 and 1968. These show a decline in the number of angler-days at both the Lake and Rapids Camps and a slight increase at the King Salmon Air Force Station facility for an overall decrease of 16 percent. It is thought that the reduction of effort at the Lake and Rapids Camps was only a short-term fluctuation and may be reversed next year.

King Salmon:

Previous king salmon catch estimates have been either highly subjective or largely dependent upon information contributed in the voluntary military creel census program. The use of these reports as a reliable source of statistical information has been seriously questioned (Paddock, 1965). A creel census program incorporating personal interviews of anglers while actually on the water was initiated during the 1968 season in an attempt to improve the accuracy of catch estimates for this species.

TABLE 1 - Military Fishing Effort on the Naknek River as Indicated by Lake and Rapids Camps Utilization and Boat Rentals from Base Dock, 1968.

Facility	Angler Days 1967	1968
Base Dock	1,293	1,495
Rapids Camp	2,916	2,252
Lake Camp	3,951	3,096
Total	8,160	6,843

TABLE 2 - Estimate of Weekly Sport Catch of King Salmon, Naknek River, 1968.

Fishing Period	Anglers Per Period*	Fish Per Angler Hour	Estimated Catch	Angler Hours
6 a.m.-4 p.m. strata:				
June 2 - 8	15.0	.000	0	1,050
9 - 15	15.7	.057	63	1,099
16 - 22	18.0	.310	391	1,260
23 - 29	31.3	.076	167	2,191
June 30 - July 6	40.5	.213	604	2,835
July 7 - 12**	18.0	.340	367	1,080
Estimated total			1,592	9,515
4 p.m.-10 p.m. strata:				
June 2 - 8	15.0	.044	28	630
9 - 15	25.3	.047	50	1,063
16 - 22	58.5	.053	130	2,457
23 - 29	36.3	.138	210	1,525
June 30 - July 6	21.8	.131	120	916
7 - 12**			73***	349***
Estimated total			611	6,940
Estimated season total			2,203	16,455

*This figure is the average number of anglers observed during the periods sampled.

**This period includes only six days.

***No samples available. Proportionate average catch and effort data substituted from June 30 - July 12 period in 6 a.m. - 4 p.m. strata.

Basic catch data is summarized in Table 2 with observed catch per unit of effort during sampling periods extrapolated to yield estimates of total catch per week and for the entire season for each stratum, resulting in a total estimated sport catch for the entire season of 2,203 kings. This 28 percent increase in estimated catch over or above the previous year's figure (Paddock, 1968) was attributed to a combination of improved census methods and an increased catch made possible by a strong return of king salmon. A slight negative bias was brought into this year's estimated catch by the necessity of adopting a sampling procedure which assumed that no fish were taken after 10 p.m. The estimate may, therefore, be considered conservative.

Further analysis of the collected information indicated that 76 percent of the total effort was contributed by military anglers. Assuming no difference in the rate of fishing success, the military catch is estimated to total 1,671 fish. This compares closely with the civilian-to-military ratio noted in previous years. No significant changes in effort were observed, although the number of civilian boats in the area continued to show a gradual increase.

Of the 721 anglers whose residential status was investigated, 56 percent were Alaskans. Nearly one-half (47 percent) of all licenses were obtained prior to arrival in King Salmon and nearly 98 percent of these were secured in the Anchorage area.

The incidental catch of other species by anglers primarily seeking king salmon was approximately 15 percent of the king salmon figure. Rainbow trout and red salmon, O. nerka, predominated, with chum salmon, O. keta, and Dolly Varden char also present.

Trolling continued to provide the basic approach for the majority of anglers with 69 percent using this method as opposed to 31 percent who drifted or anchored while casting.

Rainbow Trout:

During 1968 it was possible to obtain some measures of the effort expended and success enjoyed during the early spring fishery on the Naknek River prior to the protective closure commencing on April 15. This fishery is concentrated initially in the Lake Camp area but spreads downstream to the Rapids area as the season advances. Favorable weather conditions prevailed this year from mid-February permitting a virtually continuous effort unrelieved by any other sport fishery. While neither military recreation camp was formally opened, boats were available to military anglers at the Lake Camp and were utilized regularly. Local civilian effort was also significant and continuous. Non-random observation by Sport Fish Division personnel, supplemented by first-hand reports solicited from participants in the fishery, covered approximately 67 percent of the calendar period from February 4 to March 31. This sampling yields a minimum estimate of daily effort during this time of 9.5 anglers. Since rainbow trout availability continued to increase up to the closure date, it is reasonable to assume that effort during that portion of the fishing period which was not sampled was of equal intensity. A figure of 570 angler-days may, therefore, be considered a conservative estimate of total effort for the period February 14 to April 14. Success was generally excellent over the entire period of this spring fishery, although catches varied greatly depending largely upon the ability of the individual

angler. Fishermen utilizing salmon roe were observed to make limit catches of 10 rainbow trout in as little as one and one-half hours. The mean length of rainbow trout sampled from the catches of anglers using salmon eggs is estimated at 358 mm. Rainbow trout in the 500 to 800 mm length range occurred frequently in the catches of anglers utilizing lures or lure-bait combinations, although these anglers tended to catch fewer fish. Choice of fishing location also tended to influence the size of the individual fish in the catch. Mean length of randomly sampled rainbow trout taken by the overall fishery was 397 mm.

Lake trout, S. namaycush, Arctic char, S. alpinus, grayling, Thymallus arcticus, and burbot, Lota lota, occurred in the catch occasionally.

At the end of the spring closure (April 15 through June 7) on the Naknek River, a creel census program was initiated on that portion of the river between the Rapids Camp and the outlet of Naknek Lake. The plan called for sampling during a randomly selected two-hour period on each of three randomly selected days per week. This program was continued through August 19, although cancellations of some sampling periods occurred due to the demands of other projects.

Analysis of the collected data proved the small number of samples obtained to be inadequate for the production of a reliable estimate. This stems largely from the characteristic of this fishery to concentrate on more than one species at a time, or to shift from one species to another within a relatively brief period. Therefore, no objective information is yet available, which can either describe the composition of the rainbow trout catch during the summer-fall period or yield a numerical estimate of the catch.

To obtain reliable estimates of fishing effort and catch by species in the Lake Camp to Rapids Camp portion of the river after June 7 will require the initiation of a much more intensive creel census program.

Dolly Varden:

During the month of May there was an active fishery for Dolly Varden on the Naknek River and King Salmon Creek. The fishing pressure was directed to the immediate area surrounding the Rapids Camp and on King Salmon Creek on either side of the highway.

Fishing for Dolly Varden char in the Rapids Camp area began around April 20, although this species was not available at King Salmon Creek until the first week in May when the ice cleared. A creel census survey at King Salmon Creek was initiated on May 17 and terminated on May 24 when fishing for Dolly Varden had all but ceased.

King Salmon Creek was fished mainly by military personnel from the King Salmon Air Force Station. A census showed that military anglers constituted 98 percent of the total effort. Fishing effort in the Rapids Camp area was from military construction and camp personnel preparing the facility for its June opening.

To determine angler effort in days at King Salmon Creek, it was necessary to take census data from point surveys made on seven days and extrapolate for the remainder of the approximately 20-day fishing period.

The calculated figure of 154 angler-days is probably quite conservative and a more realistic figure might be 200 angler-days.

No formal census program was conducted in the Rapids Camp area. Arbitrary observation on three separate days, however, showed 18 anglers catching 91 fish. Grayling and rainbow were occasionally taken in this fishery.

A specific fishery for Dolly Varden in these locations has recently developed. Little is known concerning the biology of these stocks, but it appears that the available numbers are adequate to support increased fishing effort.

Other Species:

The catch of red salmon was largely proportional to the effort stemming from the Lake and Rapids Camps. With an estimated escapement of over one million fish past the Naknek River towers, many of which spawn in the vicinity of the Naknek Lake outlet, there was no shortage of this species.

Pink salmon, O. gorbuscha, returned in at least average strength for this even-year run and did enter the fishery strongly for a time, particularly at the Lake and Rapids Camps.

Silver salmon, O. kisutch, returned in greater than usual numbers and were the subject of an apparent increased effort, especially off the mouth of King Salmon Creek. It is thought that the increased figure for angler participation at the Base Dock primarily reflects added effort on silver salmon during the months of August and early September. Aerial surveys of silver salmon escapement reported in Job No. 12-A indicate that the stock is capable of supporting this fishery at its present level.

Kvichak Watershed

Igiugig Area:

A comprehensive census has never been carried out at this location throughout the entire season, and coverage during the reporting period was limited to the dates of August 12 to 23, after the summer red salmon fishery and prior to the main fall influx of rainbow from Lake Iliamna. Angling effort during the above dates consisted largely of utilization by Air National Guard personnel. Catches were composed primarily of grayling, small rainbow trout and silver salmon.

While no consistent sampling was possible during September, it is felt that effort on rainbow trout was probably more intensive than in any prior year, with the Air Guard, the Kvichak Club and Kvichak Lodge all contributing, in addition to other guided parties and individual anglers flying in for unguided fishing.

Lower Talarik Creek:

A complete census of effort at this remote site was obtained for the period August 24 through September 6, which corresponds with the approximate first half of the fall rainbow season at this location. During this two-week period, a total of 96 anglers was enumerated. As many as five float aircraft were present on the creek at one time. In the majority of cases, no difficulty in filling bag limits was observed.

Ugashik Watershed

A military recreation camp was operated at the Ugashik Narrows during the months of June through August. No accurate figure for effort is available from this facility, which was intended primarily for high-ranking military personnel. Little utilization was made prior to August.

Civilian effort at the Narrows was reported by personnel of the military camp to be consistently present almost daily throughout July and August, unless weather prohibited. Visits by Fish and Game personnel later in the season confirmed that incidental fishing pressure from hunting camps in the area is also significant and consistent. During fall months, Arctic char/Dolly Varden comprised much of the catch, with the grayling catch dwindling by mid-October.

The Narrows, which lies between Upper and Lower Ugashik Lakes, apparently attracts much more fishing effort than that portion of the Ugashik River lying below the outlet of the lower lake. Observations at the latter site, covering much of the summer and fall, indicate only scattered visits by anglers. Grayling availability extends through the month of October at this location, and the occurrence of Arctic char/Dolly Varden in the bag is much lower than at the Narrows.

Wood River-Tikchik Lakes Area

No investigations were carried out in the Wood River Lake or Togiak watersheds.

The Tikchik area was visited briefly. The site of the military recovery effort for the C-123 cargo plane which fell through the ice in connection with the attempt to establish a commercial freshwater fishery has been vacated and the cabin turned over to the Department of Fish and Game.

Guide Theodore J. Almasy's camp was again inoperative for the entire season. Guide Bob Curtis' camp at Tikchik Narrows has been in operation, but activity there terminated early in August. A feature of his program has been float trips by raft on nearby rivers such as the Tikchik, King Salmon and the Upper Nushagak Rivers.

Katmai National Monument

The number of individual visitors reported by the National Park Service for the past three years was as follows: 1966 - 861; 1967 - 1,178; 1968 - 1,584. The total visitor-days for 1968 was estimated by that agency at 6,702. The majority of these guests visited the Wien Consolidated Airlines Angler's Paradise Camp on Brooks River or the Park Service campground at the same location and remained for an average of four days. As

in 1967, it is again estimated that approximately 75 percent of all Brooks River campers participated in sport fishing to some degree. The percentage of anglers among those visiting other locations within the monument was undoubtedly higher.

While most fishing effort has in the past been directed at the Brooks River, during this reporting period a new troll fishery has developed in the Bay of Islands along the north shore of Naknek Lake. To better take advantage of this new fishery in future seasons, the management of the Angler's Paradise Camps is obtaining a 32-foot boat.

Other Fishing Pressures

As in 1967, inquiries were again sent to most of the guides and lodge operators known to be doing business in the area. A number of operators reported an increase of effort through expansion of their facilities or by operating over a longer period. Others indicated having continued to operate at the previously reported level, having already reached a saturation point. Wien Consolidated Airline's Kulik Camp reported a 30 percent increase in traffic, but Camp Manager John Walatka is of the opinion that fishing pressure had not risen correspondingly, since family groups were becoming more common and the percentage of guests whose primary interest is angling was thereby decreasing.[1/]

At Iliamna, the Iliaska Lodge operated during the summer season, although it had not remained open during the winter and early spring. An increasing number of other new charter or guide services has been observed bringing fishermen into the area on a limited scale. None of these may be singly responsible for a significant addition to the area's use statistics, but when added to an obviously increasing utilization of privately-owned aircraft from the Anchorage-Kenai area, they attained collective importance. Both observations and reports indicated that the rainbow trout streams tributary to Lake Iliamna were experiencing use, due both to their proximity to population centers and to the excellent fishing success which may be found there.

LITERATURE CITED

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1/ Personal correspondence.

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